Behavioral Ecology and Sociobiology

Volume 43 · 1998

Founding Editor

Hubert ("Jim") Markl
Konstanz, Germany

Chief Editor

Tatiana Czeschlik
Editorial Office
Behavioral Ecology
and Sociobiology
Springer-Verlag
Tiergartenstrasse 17
D-69121 Heidelberg
Germany
e-mail: bes@pk.she.de
Fax: +49-6221-409840

Editorial Assistant

Andrea Pillmann

Associate Editors

Monique Borgerhoff-Mulder
Davis, CA, USA

Sue Boinski
Gainesville, FL, USA

Scott Creel
Bozeman, MT, USA

Ross H. Crozier
Bundoora, Australia

Mark A. Elgar
Melbourne, Australia

Robert Gibson
Lincoln, NE, USA

Darryl T. Gwynne
Mississauga, Canada

Jacob Höglund
Uppsala, Sweden

Alejandro Kacelnik
Oxford, UK

Peter M. Kappeler
Göttingen, Germany

Neil B. Metcalfe
Glasgow, UK

Robin F.A. Moritz
Halle/Saale, Germany

Pekka Pamilo
Uppsala, Sweden

Stephen Pruett-Jones
Chicago, IL, USA

Anne E. Pusey
St. Paul, MN, USA

John D. Reynolds
Norwich, UK

William A. Searcy
Coral Gables, FL, USA

Ray Semlitsch
Columbia, MO, USA

Leigh W. Simmons
Nedlands, Australia

Paul Thompson
Aberdeen, UK

Advisory Editors

J. Alcock, Tempe, AZ, USA
J. Altmann, Chicago, IL, USA
W. Arnold, Vienna, Austria
G.W. Barlow, Berkeley, CA, USA
J.J. Boomsma, Aarhus, DK
J.W. Bradbury, La Jolla, CA, USA
T. Caraco, Albany, NY, USA
A. Cockburn, Canberra City, Australia
B. Crespi, Burnaby, Canada
F. Gilbert, Nottingham, UK
L.-A. Giraldeau, Montreal, Canada
P.A. Gowaty, Athens, GA, USA
A. Grafen, Oxford, UK
P. Harvey, Oxford, UK
G. Hill, Auburn, AL, USA
B. Hölldobler, Würzburg, Germany
B. König, Zurich, Switzerland
A. Magurran, St Andrews, UK
C.D. Michener, Lawrence, KS, USA
R. Montgomerie, Kingston, Canada
D.C. Queller, Houston, TX, USA
E. Ranta, Helsinki, Finland
F. Ratnieks, Sheffield, UK
G. Ruxton, Glasgow, UK
M.J. Ryan, Austin, TX, USA
R.C. Sargent, Lexington, USA
C. van Schaik, Durham, NC, USA
P.L. Schwagmeyer, Norman, OK, USA
T.D. Seeley, Ithaca, NY, USA
R. Shine, Sydney, Australia
J. Stamps, Davis, CA, USA
F. Trillmich, Bielefeld, Germany
P.J. Weatherhead, Ottawa, Canada
K.D. Wells, Storrs, CT, USA
D. Westneat, Lexington, KY, USA
G. Wilkinson, College Park, MD, USA
R. Wrangham, Cambridge, MA, USA
K. Yasukawa, Beloit, WI, USA
M. Zuk, Riverside, CA, USA

Springer

Behavioral Ecology and Sociobiology

Founded in 1976 by H. Markl

Managing Editor for Vols. 1-21 (1976-1987): H. Markl

Managing Editor for Vols. 22-33 (1988-1993): K.E. Linsenmair

Chief Editor as of Vol. 34 (1994): T. Czeschlik

Springer

Copyright

Submission of a manuscript implies: that the work described has not been published before (except in the form of an abstract or as part of a published lecture, review, or thesis); that it is not under consideration for publication elsewhere; that its publication has been approved by all coauthors, if any, as well as by the responsible authorities at the institute where the work has been carried out; that, if and when the manuscript is accepted for publication, the authors agree to automatic transfer of the copyright to the publisher; and that the manuscript will not be published elsewhere in any language without the consent of the copyright holders.

All articles published in this journal are protected by copyright, which covers the exclusive rights to reproduce and distribute the article (e.g., as offprints), all translation rights as well as the rights to publish the article in any electronic form. No material published in this journal may be reproduced photographically or stored on microfilm, in electronic data bases, video disks, etc., without first obtaining written permission from the publisher.

The use of general descriptive names, trade names, trademarks, etc., in this publication, even if not specifically identified, does not imply that these names are not protected by the relevant laws and regulations.

While the advice and information in this journal is believed to be true and accurate at the date of its going to press, neither the authors, the editors, nor the publisher can accept any legal responsibility for any errors or omissions that may be made. The publisher makes no warranty, express or implied, with respect to the material contained herein.

Special regulations for photocopies in the USA: Photocopies may be made for personal or in-house use beyond the limitations stipulated under Section 107 or 108 of U.S. Copyright Law, provided a fee is paid. All fees should be paid to the Copyright Clearance Center, Inc., 21 Congress Street, Salem, MA 01970, USA, stating the ISSN 0340-5443, the volume, and the first and last page numbers of each article copied. The copyright owner's consent does not include copying for general distribution, promotion, new works, or resale. In these cases, specific written permission must first be obtained from the publisher.

The Canada Institute for Scientific and Technical Information (CISTI) provides a comprehensive, world-wide document delivery service for all Springer-Verlag journals. For more information, or to place an order for a copyright-cleared Springer-Verlag document, please contact Client Assistant, Document Delivery, Canada Institute for Scientific and Technical Information, Ottawa K1A 0S2, Canada (e-mail: cisti.docdel@nrc.ca, Tel.: + 1-613-993-9251, Fax: + 1-613-952-8243).

Typesetter: Scientific Publishing Services (P) Ltd., Madras, India.
Printed in Germany by Universitätsdruckerei H. Stürtz AG, Würzburg, Germany.
© Springer-Verlag Berlin Heidelberg 1998

Contents of Volume 43 · 1998

No. 1 pp 1–72 published 29 June 1998
No. 2 pp 73–146 published 24 July 1998
No. 3 pp 147–222 published 10 August 1998
Nos. 4/5 pp 223–344 published 24 August 1998
No. 6 pp 345–410 published 24 September 1998

Aanes R → Tveraa T
Allainé D → Goossens B
Allen JA → Stout JC
Angel JE → Moore D
Apcin J → Wanker R

Barlow GW → Reavis RH
Bel M-C → Goossens B
Beye M, Neumann P, Chapuisat M, Pamilo P, Moritz RFA: Nestmate recognition and the genetic relatedness of nests in the ant *Formica pratensis* 67
Birgersson B: Male-biased maternal expenditure and associated costs in fallow deer 87
Birkhead TR → Westneat DF
Boag PT → Briskie JV
Boag PT → Otter K
Briskie JV, Montgomerie R, Põldmaa T, Boag PT: Paternity and paternal care in the polygynandrous Smith's longspur 181
Burger J: Effects of incubation temperature on hatchling pine snakes: implications for survival 11

Caley MJ → Munday PL
Chapman TW, Crespi B: High relatedness and inbreeding in two species of haplodiploid eusocial thrips (Insecta: Thysanoptera) revealed by microsatellite analysis 301
Chapuisat M → Beye M
Cheeseman IM → Moore D
Coulon J → Goossens B
Crespi B → Chapman TW

Dearborn DC: Begging behavior and food acquisition by brown-headed cowbird nestlings 259
Dreller C: Division of labor between scouts and recruits: genetic influence and mechanisms 191
Drummond H → Osorio-Beristain M

Ellegren H → Johnsen A
Erikstad KE → Tveraa T

Fahrbach SE → Moore D
Farand E → Goossens B
Fletcher F → Westneat DF
Fraterrigo JM → Westneat DF
Freake MJ: Variation in homeward orientation performance in the sleepy lizard (*Tiliqua rugosa*): effects of sex and reproductive period 339

Getz LL → McGuire B
Goossens B, Graziani L, Waits LP, Farand E, Magnolon S, Coulon J, Bel M-C, Taberlet P, Allainé D: Extra-pair paternity in the monogamous Alpine marmot revealed by nuclear DNA microsatellite analysis 281
Goulson D → Stout JC
Graziani L → Goossens B
Greenfield MD → Snedden WA

Haugh C → Wiltschko R
Hefetz A → Lahav S
Heller K-G → Lehmann GUC
Hemborg C, Lundberg A: Costs of overlapping reproduction and moult in passerine birds: an experiment with the pied flycatcher 19
Heymann EW: Sex differences in olfactory communication in a primate, the moustached tamarin, *Saguinus mystax* (Callitrichinae) 37
Horsup AB → Spencer PBS

Jang Y → Snedden WA
Jennerjahn B → Wanker R
Johnsen A, Lifjeld JT, Rohde PA, Primmer CR, Ellegren H: Sexual conflict over fertilizations: female bluethroats escape male paternity guards 401
Jones GP → Munday PL
Jutkiewicz E → Lewis SM

Kappeler PM → Schmid J

Lahav S, Soroker V, Vander Meer RK, Hefetz A: Nestmate recognition in the ant *Cataglyphis niger*: do queens matter? 203
Lehmann GUC, Heller K-G: Bushcricket song structure and predation by the acoustically orienting parasitoid fly *Therobia leonidei* (Diptera: Tachinidae: Ormiini) 239
Lewis SM, Jutkiewicz E: Sperm precedence and sperm storage in multiply mated red flour beetles 365
Lifjeld JT → Johnsen A
Lundberg A → Hemborg C
Lundy KJ, Parker PG, Zahavi A: Reproduction by subordinates in cooperatively breeding Arabian babblers is uncommon but predictable 173

Magnolon S → Goossens B
Marsh HD → Spencer PBS
McGraw LA → Westneat DF
McGuire B, Getz LL: The nature and frequency of social interactions among free-living prairie voles (*Microtus ochrogaster*) 271
Michaud D → Otter K
Millar JS → Topping MG
Miller III DG: Consequences of communal gall occupation and a test for kin discrimination in the aphid *Tamalia coweni* (Cockerell) (Homoptera: Aphididae) 95
Møller AP, Ninni P: Sperm competition and sexual selection: a meta-analysis of paternity studies of birds 345
Montgomerie R → Briskie JV
Moore D, Angel JE, Cheeseman IM, Fahrbach SE, Robinson GE: Timekeeping in the honey bee colony: integration of circadian rhythms and division of labor 147
Moritz RFA → Beye M
Munday PL, Caley MJ, Jones GP: Bidirectional sex change in a coral-dwelling goby 371

Nakata K: Absence of sex-differential brood raising by workers in *Diacamma* sp. from Japan 223
Neumann P → Beye M
Nieh JC: The role of a scent beacon in the communication of food location by the stingless bee, *Melipona panamica* 47
Nieh JC: The food recruitment dance of the stingless bee, *Melipona panamica* 133
Nieh JC, Roubik DW: Potential mechanisms for the communication of height and distance by a stingless bee, *Melipona panamica* 387
Ninni P → Møller AP

O'Donnell S: Dominance and polyethism in the eusocial wasp *Mischocyttarus mastigophorus* (Hymenoptera: Vespidae) 327
Olsson M, Shine R: Chemosensory mate recognition may facilitate prolonged mate guarding by male snow skinks, *Niveoscincus microlepidotus* 359
Osorio-Beristain M, Drummond H: Non-aggressive mate guarding by the blue-footed booby: a balance of female and male control 307
Otter K, Ratcliffe L, Michaud D, Boag PT: Do female black-capped chickadees prefer high-ranking males as extra-pair partners? 25

Pamilo P → Beye M
Parker PG → Lundy KJ
Peuhkuri N: Shoal composition, body size and foraging in sticklebacks 333
Primmer CR → Johnsen A
Põldmaa T → Briskie JV

Rasa OAE: Biparental investment and reproductive success in a subsocial desert beetle: the role of maternal effort 105
Ratcliffe L → Otter K
Reavis RH, Barlow GW: Why is the coral-reef fish *Valenciennea strigata* (Gobiidae) monogamous? 229
Robertson GJ: Egg adoption can explain joint egg-laying in common eiders 289
Robertson IC, Roitberg BD: Duration of paternal care in pine engraver beetles: why do larger males care less? 379
Robinson GE → Moore D
Rohde PA → Johnsen A

Roitberg BD → Robertson IC
Roubik DW → Nieh JC

Sæther B-E → Tveraa T
Schino G, Troisi A: Mother-infant conflict over behavioral thermoregulation in Japanese macaques 81
Schmid J, Kappeler PM: Fluctuating sexual dimorphism and differential hibernation by sex in a primate, the gray mouse lemur (*Microcebus murinus*) 125
Shine R → Olsson M
Snedden WA, Greenfield MD, Jang Y: Mechanisms of selective attention in grasshopper choruses: who listens to whom? 59
Soroker V → Lahav S
Spencer PBS, Horsup AB, Marsh HD: Enhancement of reproductive success through mate choice in a social rock-wallaby, *Petrogale assimilis* (Macropodidae) as revealed by microsatellite markers 1
Stout JC, Goulson D, Allen JA: Repellent scent-marking of flowers by a guild of foraging bumblebees (*Bombus* spp.) 317
Stutchbury BJM: Female mate choice of extra-pair males: breeding synchrony is important 213
Stutchbury BJM: Breeding synchrony best explains variation in extra-pair mating system among avian species 221

Taberlet P → Goossens B
Topping MG, Millar JS: Mating patterns and reproductive success in the bushy-tailed woodrat (*Neotoma cinerea*), as revealed by DNA fingerprinting 115
Troisi A → Schino G
Tschinkel WR: An experimental study of pleometrotic colony founding in the fire ant, *Solenopsis invicta*: what is the basis for association? 247
Tveraa T, Sæther B-E, Aanes R, Erikstad KE: Body mass and parental decisions in the Antarctic petrel *Thalassoica antarctica*: how long should the parents guard the chick? 73

Vander Meer RK → Lahav S

Waibel B → Wanker R
Waits LP → Goossens B
Walker M → Wiltschko R
Wanker R, Apcin J, Jennerjahn B, Waibel B: Discrimination of different social companions in spectacled parrotlets (*Forpus conspicillatus*): evidence for individual vocal recognition 197
Weatherhead PJ, Yezerinac SM: Breeding synchrony and extra-pair mating in birds 217
Westneat DF, McGraw LA, Fraterrigo JM, Birkhead TR, Fletcher F: Patterns of courtship behavior and ejaculate characteristics in male red-winged blackbirds 161
Wiltschko R, Haugh C, Walker M, Wiltschko W: Pigeon homing: sun compass use in the southern hemisphere 297
Wiltschko W → Wiltschko R

Yezerinac SM → Weatherhead PJ

Zahavi A → Lundy KJ

Indexed in *Current Contents and Environmental Periodicals Bibliography (EPB)*